

# CLOTHING SHIELD WITH OPENING MECHANISM

## FIELD OF THE INVENTION

The present invention relates to clothing shields (e.g., bibs), and more  
5 specifically, to a clothing shield having an opening member that causes the clothing  
shield pocket to open when the clothing shield is used.

## BACKGROUND

Many activities, such as eating, washing, or oral care, can cause soiling and  
10 inadvertent spillage. Various types of protective garments (e.g., bibs or napkins) have  
been designed in an attempt to solve this problem. Bibs can be provided for use on  
babies through adults. Disposable bibs can be constructed of multiple layers. For  
instance, disposable bibs can include an absorbent top layer for receiving spilled food  
material and a plastic film back layer for preventing spilled liquids from penetrating  
15 through the bib and onto the wearer's clothing.

Many bibs also have "crumb-catchers" (a pocket for receiving spilled food or  
liquid). However, the crumb-catchers previously employed with conventional bibs have  
not readily remained open. For example, there are bibs that depend on non-cooperative  
gravitational forces acting on an apron panel to maintain the bib pocket in an open  
20 configuration. The effectiveness of such a design can be affected by the vertical  
orientation of the wearer and/or the bib.

Furthermore, many "crumb catchers" require the user to do extra steps of folding,  
inflating, flipping inside out, or attaching extra tape tabs to other parts of the body or  
table. For example, there are bibs that include adhesive tabs designed to attach the front  
25 lip of the pocket to the edge of a table and thereby hold the bib pocket open. These extra  
steps may make the user less likely to use the product again in the future. In addition,  
protective garment configurations which attach a part of the bib to a piece of furniture  
can undesirably limit the movement of the wearer and can put excessive stress on the bib  
structure.

30 Thus, conventional protective garments, such as those described above, are not  
completely satisfactory. Furthermore, conventional protective garments have required

complex and often relatively expensive manufacturing techniques. Accordingly, there remains a need for an inexpensive clothing shield having a pocket, for receiving and holding spilled solid and liquid food material, which can be flattened for packaging, and will open up during use with little or no effort required by the user.

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### **SUMMARY OF THE INVENTION**

The present invention is directed to a clothing shield, preferably an inexpensive, disposable clothing shield, having a pocket that easily opens and remains open through action of an opening member disposed in the pocket. The clothing shield may include a chest section having attachment devices for securing the clothing shield to a wearer, a pocket section including an opening member that causes the pocket to open when the clothing shield is used, and an optional lap section. The chest section can also include shoulder extensions extending from the chest section. The chest, pocket, and optional lap sections can be contiguously joined to form the clothing shield as a unitary construction.

Preferred features include a clothing shield having a body side and an outward side. Preferably, the clothing shield includes a chest section having a top and a bottom, with the top of the chest section preferably having attachment devices for securing the clothing shield. A pocket section formed of a front segment, a back segment and two joined side segments is also preferred. Also preferred is a lap section joined to the front segment or crease of the pocket section, such that the lap section covers the lap of the wearer when the clothing shield is used. The lap section is optional such that the clothing shield may include the chest and pocket section alone or in combination with the lap section.

### **BRIEF DESCRIPTION OF THE FIGURES**

The invention will be more fully understood and further advantages will become apparent when reference is made to the following detailed description of the invention and the drawings in which:

FIG. 1 shows a view of a representative clothing shield.

FIGS. 2A-G depicts a view of a representative clothing shield (2A) and multiple enlarged views of the pocket (2B-2G).

- FIGS. 3A-E representatively show exploded cross-sectional side views of alternative pocket and opening member configurations.
- FIGS. 4A-B representatively show front perspective views of alternative opening member configurations.
- 5 FIG. 5 shows a view of a representative clothing shield before pocket section construction.
- FIG. 6 representatively depicts a side view of a representative clothing shield.
- FIGS. 7A-C representatively depicts a front perspective view of a clothing shield (A) and magnified top views of the pocket section (B-C).
- 10 FIG. 8 depicts an enlarged view of a representative attachment device.

### **DETAILED DESCRIPTION**

The following description of the protective garment of the invention will be made in the context of a clothing shield, preferably a disposable clothing shield. However, it will be readily apparent that the present invention can be adapted for use and incorporated into other protective garments, such as aprons and the like. All such uses are contemplated as being within the scope of the present invention.

Many activities, such as eating, washing, or oral care, can cause soiling, especially when done on furniture, such as beds, or other awkward places such as airplane or car seats. Currently, ineffective makeshift cloths, towels, and napkins are used. Thus, there is a clear need for clothing shields, preferably disposable clothing shields, to help keep the wearer, his or her clothing and the immediate surrounding environment, such as bedding, furniture (e.g., beds, chairs, etc.) and floors, clean during activities such as eating, washing or oral care. The present invention provides a clothing shield 10 including a pocket section 20 which is easily opened and readily maintained in an open configuration by utilizing the energy stored in an opening member 30 to control the ability of the pocket to open. Opening member 30 may be a spring, wire, hinge, ratchet, tape, coil, shape memory alloys (e.g., nitinol) or other resilient member. Thus, one embodiment provides an inexpensive, clothing shield 10 having a pocket section 20 which can be maintained in an open configuration, for receiving and holding spilled solid

and liquid food material, with little or no effort required by the user. Preferably the clothing shield is disposable.

Referring to FIGS. 1, 5 and 6, clothing shield 10 includes a body side 12, an outward side 14 and a cutout for the neck 100. A chest section 15 having a top 16 and a bottom 18. A pocket section 20 having a front segment 22, a back segment 24, two side segments 26 and 27 (as depicted in FIG. 5), and a fold line (where the pocket can be folded, creased and/or scored or weakened for later folding or creasing) 28. The pocket section 20 has an opening member 30 for opening the pocket section 20 when the clothing shield 10 is used. The back segment 24 of the pocket section 20 may be joined to the bottom 18 of the chest section 15. An optional lap section 40 may be joined to the front segment 22 of the pocket section 20, either at the top edge of the front segment 22 (preferred), at the bottom edge of the front segment 22, or alternatively at the fold line 28. One or more attachment devices 50 (FIG. 8) to secure the clothing shield 10 on a wearer are also preferably included. Preferably, the clothing shield 10 can be wore multiple times until soiled and then may be disposed of.

The clothing shield 10 can be conveniently secured to the wearer. This can be accomplished through the use of attachment devices 50 (FIG. 8), including shoulder tape tabs (similar to tabs used to secure disposable diapers) which can be pulled up and pressed onto the wearer's clothes, reusable adhesive, a high density pin array (e.g., a mechanical hook), a string which may be placed around the back of the wearer's neck, ties (e.g., textile or nonwoven ties), head holes, collar tuck tabs and/or clips. Preferably, shoulder tape tabs are used for securing the clothing shield 10 to the wearer. More preferably, the tape tabs are disposable absorbent article fastening tape tabs. Preferably, the tape tabs extend vertically with respect to the wearer; however, other configurations can be envisioned. A frontal fastening system may allow for greater independence of the care recipient and less strain/bother than tying behind the neck. Preferably, the tape tabs are designed for multiple use (e.g., should the clothing shield 10 not be greatly soiled after use) and will not harm the wearer's clothing, increasing the value to the consumer.

One embodiment provides a chest section 15 composed of any suitable material, as discussed in detail below. Preferably, the chest section 15 has two layers, a body side 12 and an outward side 14. The body side 12 is preferably composed of substantially

liquid impermeable material (backsheet), such as polyethylene or polypropylene films, which may run the full length of the clothing shield (from the top 16 of the chest section 15 to the end of the optional lap section 40). The liquid impermeable material prevents penetration of the fluids from soaking through to the clothes of the wearer and preferably has a quiet, soft texture. A good example of a liquid impermeable material that has a quiet, soft texture would be highly breathable stretch thermal laminate (HBSTL; U.S. Patent Nos. 5,695,868 and 5,855,999, the disclosures of which are incorporated herein by reference).

The outward side 14 is preferably composed of an absorbent material, such as tissue, meltblown (pulp/polypropylene), airformed, wetformed, mechanically formed (carded or stranded), directly spun, or hydro-entangled absorbent fibers. Additionally, the absorbent material may include super absorbent material (SAM), odor control additives or deodorants, printing, or embossing. When outward side 14 is composed of absorbent material, the absorbent material can run the full length of the clothing shield 10 or only the chest section 15, the pocket section 20, the optional lap section 40, or any combination thereof. The absorbent material can be used with or without the use of an additional woven or nonwoven topsheet (such as a spunbond liner), and provides the integrity and absorbency useful for a functional chest section 15, pocket section 20 and/or lap section 40. The outward side 14 is attached in adjacent, facing relation with the body side 12. With this configuration, the substantially liquid impermeable body side 12 protects the wearer's clothes from spilled or dropped materials, and the absorbent outward side 14 helps to retain spilled liquids and reduce runoff.

The pocket section 20 is preferably formed from the same material as the chest section 15. The pocket section 20 provides a mechanism to catch dropped food. As shown in FIGS. 4A-B, segments 26 and 27 are attached together (with the aid of adhesive (continuous or intermittent), stitching, ultrasonic or thermal bonding or any other means of attaching known to those skilled in the art) upon folding of the pocket section 20 along fold line 28. Preferably, the side segments 26 and 27 are bonded to each other ultrasonically. The folding and seaming gives the pocket section 20 a pocket-shaped configuration with exceptional capability for holding and catching spilled liquids and solids. As may be seen from FIG. 1, the pocket section 20 may extend the full width of

the chest **15** and optional lap **40** sections. Preferably, the pocket section is about 0.5 to 5.0 inches high, although a greater or lesser height may be employed to conform to the size of the particular clothing shield **10** construction.

The opening member **30** has the ability to automatically open the pocket when the clothing shield is used or worn. A reliable opening of pocket section **20** is important, especially for those reclining or with large chests/abdomens. One or more opening member(s) **30** can be placed in any configuration along the fold line **28** that forms the bottom of the pocket section **20** as representatively shown in FIGS 2B-2E and 3A-3C. In addition, opening member **30** can be located on top of, under, or in between any one of the layers as shown in FIGS. 3A-C. Also, opening member **30** can be placed at the top (FIG. 4A), along the top (FIG. 4B), or middle of pocket section **20**, as shown in FIGS 2F-G and 3D-E. Preferably, the opening member **30** is placed on the fold line **28** that forms the bottom of pocket section **20**, ensuring that it can apply force to pocket section **10** on either side of the fold line **28**. Preferably, opening member **30** provides force directly to the pocket section **20** of the clothing shield **10** and thereby reduces the overall force necessary to open the pocket section **20**. The preferred opening member **30** configuration of clothing shield **10** is as depicted in FIG. 2C.

The opening member **30** can be made from any number of materials or designs. One embodiment provides a resilient (capable of returning to an original shape or position, as in after having been compressed) opening member. Preferably, the resilient opening member **30** has shape "memory" so that it has the tendency to automatically open after any external stress is removed (e.g., packaging, processing, unfolding of shield etc.). For example, upon the unfolding of the clothing shield, or removing the clothing shield from its packaging, the resilient member pops-open (spring open), causing the pocket to automatically (acting or operating in a manner essentially independent of external influence or control) open, and thus, be in an open position to catch spills, crumbs, food or liquids. The opening member **30** can be attached by various techniques known in the art (e.g., by the use of adhesive, glue, stitching, ultrasonic or thermal bonding). The resilient opening member **30** can be wholly attached, partially attached, or may be completely unattached if sandwiched between layers of materials as representatively depicted in FIG. 3B. The resilient opening member **30** can include a

piece of tape (such as filament tape (a fine or thinly spun thread, fiber, or wire within the tape) currently used in packaging), a piece of material that is able to elastically deform, including elastic (capable of returning to an initial form or state after deformation), or a spring (an elastic device, such as a coil of wire, that regains its original shape after being compressed or extended) 200 (as depicted in FIG. 3E).

Another embodiment provides a live hinge-opening member 30. This hinge-opening member 30 can contain at least two "positions". The hinge-opening member 30 can either be closed (as in when the clothing shield 10 is in its packaged form with the pocket section 20 closed), or opened (after the user has "activated" the live hinge opening member 30 by pressing it open just prior to using). The hinge-opening member 30 can also have a number of different positions between closed and open, which may be tailored to the user's preferences. Examples of live hinges 30 are plastic lids on resealable containers such as found used to contain shampoo or toothpaste (e.g., a material, such as plastic, with a knee bend).

Another embodiment provides a moldable opening member 30. This moldable opening member 30 could be positioned anywhere along the pocket section 10, and then deformed or molded to the desired level of openness. Moldable opening members 30 for use in the present invention may be formed from pliable or flexible (easily bent or shaped; receptive to change or adaptable) wire, such as that found in a baggy tie or Breath Right ® strip or a paper clip, aluminum tape, or other pliable/flexible materials. The moldable opening member(s) 30 can be positioned in the same fashion as the resilient opening member 30, but may also be placed on the top of the pocket section 20 (as depicted in FIGS. 4A and B). If the moldable opening member 30 is attached on the top of the pocket section 20, it may also be attached to the outward side 14 of the middle of the chest section 10 for greater ease in opening (FIG 4A).

For packaging purposes and to produce a more effective opening member 30, the body side 12 and/or outward side 14 of the clothing shield 10 may be folded along lines 400, which should not intersect opening member 30 (FIGS. 2B-G and 7A). The folding of the clothing shield 10, as outlined in FIGS. 2B-G and 7A, ensures that the opening member is not unnecessarily creased during folding prior to or during packaging. Preferably, clothing shield 10 is folded in thirds (as depicted in FIGS. 7A, 2B, 2D, 2F and

2G). The clothing shield **10** may also be folded in half along its vertical axis prior to or after folding in thirds. Furthermore, the folding of the clothing shield **10** can help to produce a pocket section **20** that has a greater tendency to open automatically when in use and optionally close on itself when no longer in use for ease of storage and/or disposal. For example, if clothing shield **10** is folded in thirds (as depicted in Fig. 7A) on top of the outward side **14** of clothing shield **10** (i.e., fold towards the front of clothing shield **10**), the pocket section **10** will curve away from the body of the wearer during use and facilitate opening of the pocket section **10** as depicted in FIG. 7B. Alternatively, clothing shield **10** can be folded in thirds (as depicted in FIG. 7A) on top of body side **12**, resulting in the pocket section **10** curving towards the body the of the wearer when in use (FIG. 7C).

The optional lap section **40** keeps solids and liquids off the lap of the wearer. The outward side **14** of the lap section **40** can optionally have an outward side **14** absorbent layer or a textured surface, which may be liquid impermeable and/or absorbent, to allow for adsorption of spills and/or hand wiping. Furthermore, the optional lap section **40** can optionally be composed of materials different from those used to make the chest section **15** and the pocket section **20**.

One advantage of the clothing shield of the present invention is that it protects better than typical paper napkins or towels and is more convenient than cloth towels/fabric that require washing and are not designed for the job. While other forms of protection may be available, none has the convenience and performance of the clothing shield **10** of the present invention (for example, paper towels and napkins (insufficient protection against spills), cloth towels and napkins (permeable, require laundering), plastic bibs (noisy, fluid runoff), terry cloth with plastic backing (expensive, require laundering) and paper bibs (poor availability, insufficient protection)). Further, use of the clothing shield **10** offers consumers multiple benefits: the shields catch small and large spills on the absorbent layer and in the pocket section **20**, keep the wearer clean and dry (by the use of a liquid impermeable body side **12**), are easy to apply and remove from the clothing of the wearer (with tape tabs **50** at the shoulders of the chest section **15**), provide full protection of the wearer's cloths and surrounding environment (chest section **15** with neck cutout **100**, pocket section **20** and optional lap section **40**), and are inexpensive and



convenient (easy to use, disposable, no need to launder). Use of clothing shields 10, adult, child, toddler or infant sized, means less laundry, fewer clothing changes, fewer stained/ruined clothes, and timesavings from cleaning up spills. All of these advantages will make the lives of caregivers and wearers a little simpler and easier.

5 Preferably, the clothing shield 10 includes six raw material components which include absorbent, backsheet on the body side 12 and lap section 40, opening member 30, an attachment device 50 (e.g., tape) and construction adhesive. Embodiments having more or fewer raw component materials are also envisioned. To construct the clothing shield 10, construction adhesive can be applied to the outward side 14 of a backsheet for  
10 the chest section 15. A sheet of absorbent can then be joined to the backsheet. Next, the opening member can be placed the opening member 30 in the pocket section 20. To form the pocket section 20, fold line 28 can be creased or folded and side segments 26 and 27 can be joined by ultrasonic bonding. Alternatively, intermittent adhesive application may be used to join side segments 26 and 27. Continuous adhesive is applied to the material,  
15 such as HBSTL, for the optional lap section 40 and joined to the front segment 22 of the pocket section 20. A semicircle may be cut out of the top 16 of the chest section 15 to form a neck opening 100 and adhesive tapes can be applied to each side (shoulder area) as attachment devices 50 for securing the clothing shield 10 to the wearer. The constructed clothing shield 10 can then be folded and packaged for convenience to the  
20 consumer.

Alternatively, the clothing shield 10 can be formed by forming a two layer material (having a liquid impermeable body side 12 and an absorbent outward side 14) of sufficient length for the chest section 15, pocket section 20, and optional lap section 40, cutting a semicircle for the neck 100, attaching an attachment device(s) 50, disposing an  
25 opening member in the pocket section 20, folding pocket section 20 at fold line 28, and ultrasonically bonding segments 26 and 27.

The clothing shield 10 may be constructed from a separate chest section 15, pocket section 20 and optional lap section 40, or alternatively, clothing shield 10 may be constructed from contiguous sheets of one layer or two-layer (having an absorbent and/or  
30 a liquid impermeable side) material.

